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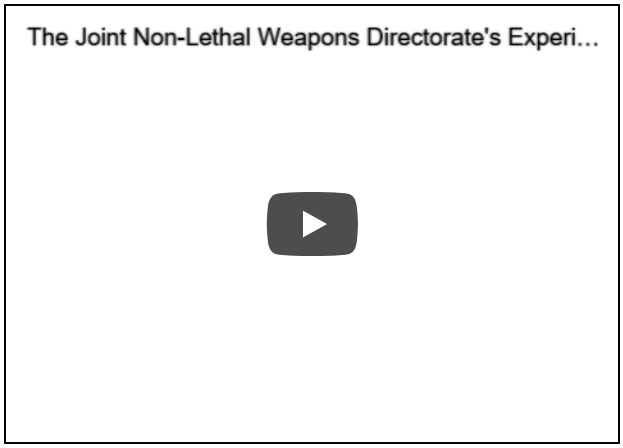
The U.S. Military Is Making Lasers Create Voices out of Thin Air

By Patrick Tucker Defense One March 21, 2018 2 Comments



Watch the video above and listen carefully for what sounds like a human voice during the second spin. That's not an audio recording or a broadcast transmitted over radio...it's not human at all. It's an auditory effect that's created by military scientists who manipulated the air with lasers — and it's the Pentagon's most interesting idea for stopping people charging checkpoints, or just scaring the crap out of them.

The U.S. military's Joint Non-Lethal Weapons Program, or JNLWD, is inching closer to a weapon that alters atoms to literally create words from thin air. It's called the Laser-Induced Plasma Effect and, fingers crossed, they hope to be able to say intelligible words within the next three years.

The weapon is composed of two parts: first, a femtosecond laser, which shoots a burst of focused light for 10–15 seconds, just long enough to rip the electrons from air molecules and create a ball of plasma. (Sometimes called the fourth state of matter, plasma is a field of electrified gas, highly responsive to electromagnetic effects.) The scientists then hit that plasma field with a second nanolaser,

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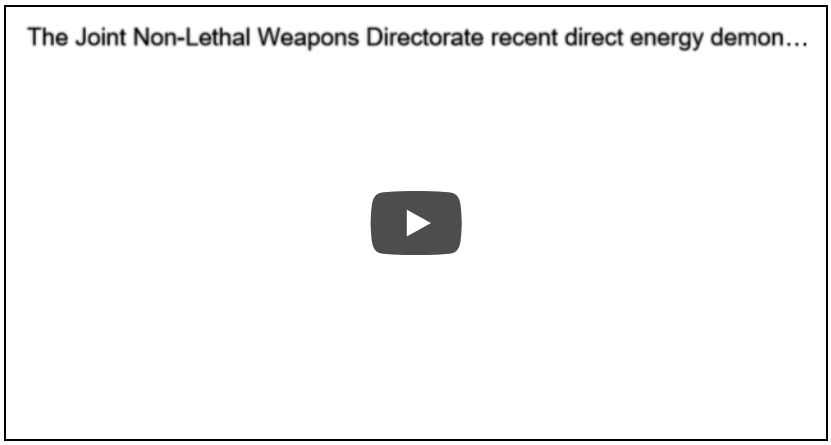
tuned to an extremely narrow range of wavelengths. They use that to manipulate the plasma field in a way that can produce light and noise. Get the interaction precise enough and you get something that sounds like a haunted walkie-talkie.

"We're *this close* to getting it to speak to us. I need three or four more kilohertz," says David Law, who runs JNLWD's technology division. Ultimately, he wants a single system that can produce multiple effects — noise, light, even heat — and replace a wide variety of non-lethal weapons that the military has been testing. We have the exclusive video.



The weapon's most interesting aspect may be the way it creates noise: at a specific and distant point in space, rather than blasting it out of a nearby speaker. That means that soldiers between the weapon and the target are unaffected.

How far away can that point be? "Range is a function of the optics. The bigger the mirrors, the father the range," Law said. A five-inch mirror creates the effect about one kilometer away; an 8-inch mirror, about five kilometers, he said. "They've created plasmas at 20 or 30 kilometers," he said. "This is the first non-lethal weapon that could go out tens of kilometers."

The Kerr effect, a term that refers to minute changes in the refractive index as a result of electromagnetic field changes, makes it actually easier to create the effect at a distance.

"One of the things about the ultra short pulse, it wants to form at longer ranges. It's harder to form at shorter ranges," said Law.

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